UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF PUERTO RICO

In re: THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO, as representative of THE COMMONWEALTH OF PUERTO RICO, et al., Debtors. [1]	PROMESA Title III Case No. 17-BK-3283-LTS (Jointly Administered)
In re: THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO, as representative of PUERTO RICO ELECTRIC POWER AUTHORITY, Debtor.	PROMESA Title III Case No. 17-BK-4780-LTS (Jointly Administered)
THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO, Plaintiff, v. HON. PEDRO PIERLUISI, in his official capacity as Governor of Puerto Rico, Defendant.	Adv. Proc. No. 24-00062-LTS

[1] The Debtors in these Title III Cases, along with each Debtor's respective Title III case number and the last four (4) digits of each Debtor's federal tax identification number, as applicable, are the (i) Commonwealth of Puerto Rico (the "Commonwealth") (Bankruptcy Case No. 17-BK-3283-LTS) (Last Four Digits of Federal Tax ID: 3481); (ii) Puerto Rico Sales Tax Financing Corporation ("COFINA") (Bankruptcy Case No. 17- BK-3284-LTS) (Last Four Digits of Federal Tax ID: 8474); (III) Puerto Rico Highways and Transportation Authority ("HTA") (Bankruptcy Case No. 17-BK-3567-LTS) (Last Four Digits of Federal Tax ID: 3808); (iv) Employees Retirement System of the Government of the Commonwealth of Puerto Rico ("ERS") (Bankruptcy Case No. 17- BK-3566-LTS) (Last Four Digits of Federal Tax ID: 9686); (v) Puerto Rico Electric Power Authority ("PREPA") (Bankruptcy Case No. 17-BK-4780-LTS) (Last Four Digits of Federal Tax ID: 3747); and (vi) Puerto Rico Public Buildings Authority ("PBA") (Bankruptcy Case No. 19-BK-5523-LTS) (Last Four Digits of Federal Tax ID: 3801) (Title III case numbers are listed as Bankruptcy Case numbers due to software limitations).

DECLARATION OF STEVEN GABEL

I, Steven Gabel, hereby declare under penalty of perjury under the laws of the United States of America:

1. I am over 18 years of age, have personal knowledge of the matters set forth herein, and if called upon and sworn as a witness, I could testify competently hereto.

2. I am the President and Founder of Gabel Associates, Inc.

3. I have over 40 years of experience in assisting clients with commercial and policy issues in the energy and environmental industries.

4. I am an economist who specializes in public utility economics and regulation. I have over four decades of experience in the energy industry, working at the New Jersey Board of Public Utilities ("NJBPU") and as an energy consultant and President at Gabel Associates, Inc. Over the years my responsibilities have included working as an economist for the NJBPU; Bureau Chief of Electric Rates and Tariffs for the NJBPU; Director of the Electric Division at the NJBPU; and Director of the Division of Solid Waste at the New Jersey Department of Environmental Protection. From 1993 to the present, I have served as the President of Gabel Associates, Inc. I have testified extensively before state regulatory and legislative bodies with respect to ratemaking, cost of service, industry restructuring, energy policy, net benefit studies, renewable energy policy and tariff design issues, including direct involvement in the development of renewable energy policy, standby rates, and net metering policy. My educational background includes a BA in Economics from the University of Pennsylvania and an MA in Economics from Rutgers University, where I studied price theory, industrial organization, and the history of economic thought.

5. Gabel Associates, Inc. is an energy consulting firm that provides economic, regulatory, and technical analysis and advice to a wide range of energy clients. The firm has been

providing analysis of wholesale and retail energy markets, ratemaking and regulatory issues for over thirty years, including the analysis of avoided costs and detailed energy price modeling. The firm provides regulatory support on complex matters and expert testimony at the regional transmission organization, state, and Federal Energy Regulatory Commission level, including in Puerto Rico.

6. Gabel Associates, Inc. has provided extensive analysis in various jurisdictions related to the value of energy provided by renewable and non-renewable resources, including valuation of both direct energy values as well as environmental, societal, direct, indirect, and induced economic impact for a wide range of resources including solar, wind, offshore wind, as well as fossil resources.

7. Gabel Associates, Inc. issued a report (the "Gabel Report") on April 16, 2024, titled "Value of Net Metered Solar Energy in Puerto Rico," which provides an independent analysis and estimate of the benefits from on-site solar photovoltaic power systems in Puerto Rico, in the context of the Commonwealth's consideration of its net metering policy.

8. The Gabel Report is based on Gabel Associates, Inc.'s expertise and thirty years of experience in addressing electricity market issues as well as its review of how similar bill credits have been evaluated and implemented through the United States.

9. A true and exact copy of the full Gabel Report is attached hereto as **Exhibit 1**.

10. I stand by the findings and conclusions presented in the *Gabel* Report. The analysis and methodologies used in preparing the report are based on industry best practices, sound data, and thorough consideration of Puerto Rico's energy market conditions. I affirm that the report accurately reflects the significant direct and societal benefits of net metered solar energy in Puerto

Rico, and I fully support its conclusions. The conclusions in this report are based on my professional expertise and experience, and I continue to fully endorse them.

I declare under penalty of perjury that the information contained in this statement and the attached report is true and correct to the best of my knowledge.

Dated: October 22, 2024

Steven Gabel

GABEL DECLARATION

EXHIBIT 1

April 16, 2024

VALUE OF NET METERED SOLAR ENERGY IN PUERTO RICO

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1 EXECUTIVE SUMMARY

The purpose of this Report is for Gabel Associates, Inc. (Gabel) to provide an independent analysis (Report or Gabel Report) of the full range of benefits provided by distributed solar energy in Puerto Rico as interconnected via the island's current Net Metering laws and policies. These estimates of benefits provide a basis for setting the solar net metering credit in a way that is fair to customers, including both those with net metered solar and those without, and provides a framework for evaluation of the merits of the net metering program moving forward in an effective manner.

The analysis underlying this Report is based on Gabel's expertise and more than thirty years of experience in addressing electricity market, ratemaking and renewable energy issues throughout the United States. The firm has also testified extensively on such issues throughout the United States, including in Puerto Rico in the 2016 proceeding about net metering before the Energy Commission under Docket #CEPR-AP-2015-001.

Puerto Rico's current net metering policy allows customers with on-site solar projects to interconnect solar energy and both utilize solar energy in their own homes and businesses and, at times when they produce more solar energy than their building is consuming, receive a retail credit on their electric bill for the energy exported to the power grid.

One of the principal arguments used by critics of continuing this net metering policy is an allegation that it provides a subsidy to customers who have solar projects on their sites at the expense of other customers of LUMA. By allowing the solar customer to receive a credit at roughly the retail rate, which equates to approximately 24 cents per kWh, critics of net metering argue that this subsidizes the electric use of on-site solar customers at the expense of all other customers.

In order to determine whether such a subsidy is occurring, it is necessary to consider whether the benefits of this solar energy exceed the cost of paying the retail level net metering credit. As with any product or service, if the benefits realized by all other users of the system exceed the cost, there is no subsidy.

This Report assesses this issue by carefully evaluating the level of this net metering credit relative to the value that this solar energy provides: a) to the grid and all customers attached to the grid (entitled "direct benefits"); and b) broader benefits (entitled "social benefits") provided to all residents of Puerto Rico.

Direct benefits include the reduction in costs due to reduced fossil fuel-based power generation on the grid, and reduced forward looking transmission and distribution expenditures made possible by the solar generation. Additionally, on-site solar resources support the overall reliability and resiliency of Puerto Rico's stressed power grid, helping the economy and avoiding the potential health and safety harms of blackouts.

Social benefits include environmental and health benefits realized by reduced air emissions as well as economic benefits realized by the jobs, spending, and increased economic activity caused by solar investments.

This study calculates these benefits based on the specific cost structure of LUMA as well as the environmental and economic impacts in the Commonwealth, while taking into account the intermittent nature of solar generation.

This Report finds that:

- The **direct benefit to the grid and all other ratepayers is 33 cents per kWh**, which is 36% greater than the retail rate of 24 cents per kWh. Accordingly, there is no subsidy flowing from other ratepayers to on-site solar customers and, in fact, there are benefits flowing to all other customers from the excess solar power produced by net metered solar customers.

- In addition to these direct benefits to ratepayers, significant social benefits flow to residents of Puerto Rico. These benefits include reductions in air pollution as non-emitting solar energy offsets emissions from fossil fuel power generation. This reduced pollution yields significant health benefits to residents. Additional social benefits are realized because investments in solar projects induce greater economic activity and jobs in the Commonwealth. Our report demonstrates that these **social benefits result in an additional benefit of 70 cents per kWh on top of the direct ratepayer benefits**.

- A summary of these direct benefits and social benefits as compared to the cost of the net metering credit are provided in the chart below.

- Continuation of Puerto Rico's net metering policy would not cause customers to subsidize on-site solar customers. Quite the reverse, this policy realizes greater financial benefits than costs for all customers by providing lower cost of energy supply, grid resilience, and other benefits as detailed in this Report.

- Another benefit of continuing this policy is that it permits the continued expansion of solar development in accord with the Commonwealth's broader energy, economic development and sustainability goals. It simplifies the "messaging" to customers who are considering installing solar projects on their sites, as the net metering approach ("letting the meter spin backwards") is highly understandable to customers. This approach has been highly successful throughout the United States and Puerto Rico in supporting expansion of solar energy, furthering clean energy development, improving reliability, reducing air pollution, and promoting economic growth.

Looking forward, these on-site solar resources can be effectively integrated, working with the other positive changes being made which will add flexibility to Puerto Rico's energy system, including new, cleaner generation with greater ramping capability, utility scale and customer-sited battery storage, grid supply renewable energy resources, and other improvements. Taken together, these resources will make electricity service more reliable, cleaner, efficient, and more flexible to meet the needs of Puerto Rico.

Based on the analysis in this Report, the Commonwealth's net metering policy should continue, as the benefits of this policy clearly outweigh its costs. This will not cause a subsidy of on-site solar energy as it

reflects the benefits caused by solar and does not require the program to be underwritten by non-participating customers.

Direct Benefits

Benefit Type	Value of Solar (¢/kWh)	Value of Solar (Share of Direct Benefits)	Value of Solar (Share of Total Benefits)	Net Metering Credit (¢/kWh)
Avoided Energy Costs	27.25	82.81%	26.42%	24.12
Avoided Capacity Costs	0.60	1.84%	0.59%	-
Avoided T&D Costs	3.24	9.85%	3.14%	-
Avoided Reliability-Related Economic Losses	1.81	5.50%	1.76%	-
Subtotal	**32.90**	**100.00%**	**31.90%**	**24.12**

Societal Benefits

Benefit Type	Value of Solar (¢/kWh)	Value of Solar (Share of Societal Benefits)	Value of Solar (Share of Total Benefits)	Net Metering Credit (¢/kWh)
Avoided Emissions Costs (CO2, CH4, N2O, NOx, SO2, PM2.5)	54.46	77.55%	52.81%	-
Local Economic Value Added	15.76	22.45%	15.29%	-
Subtotal	**70.23**	**100.00%**	**68.10%**	**-**

Total Benefits

Benefit Type	Value of Solar (¢/kWh)	Value of Solar (Share of Total Benefits)	Value of Solar (Share of Total Benefits)	Net Metering Credit (¢/kWh)
Direct Benefits	32.90	31.90%	31.90%	24.12
Societal Benefits	70.23	68.10%	68.10%	-
Overall Total	**103.13**	**100.00%**	**100.00%**	**24.12**

2 INTRODUCTION

This report (Report or Gabel Report) provides an independent analysis and estimate of the benefits from on-site solar photovoltaic power systems in Puerto Rico, in the context of the Commonwealth's consideration of their net metering policy. The analysis is based on Gabel's expertise and thirty years of experience in addressing electricity market issues as well as its review of how similar Bill Credits have been evaluated and implemented throughout the United States.

2.1 Gabel Associates, Inc.

Gabel is a well-established energy consulting firm that provides economic, regulatory, and technical analysis and advice to a wide range of energy clients. The firm has been providing analysis of wholesale and retail energy markets, ratemaking and regulatory issues for over thirty years – this includes the analysis of avoided costs and detailed energy price modeling. We also provide a host of analytical and support services for power resources throughout the United States.

Gabel lives in both the world of energy market transactions (having undertaken project development for over 300 renewable and fossil-fuel generation projects and executed energy transactions for hundreds of thousands of accounts) and in the world of regulatory and policy analysis. We provide regulatory support on complex matters and expert testimony at the regional transmission organization (RTO), State, and Federal Energy Regulatory Commission (FERC) level, including in Puerto Rico.

Gabel has provided extensive analysis in various jurisdictions related to the value of energy provided by renewable and non-renewable resources, including valuations of both direct energy values as well as environmental, societal, direct, indirect, and induced economic impact for a wide range of resources including solar, wind, offshore wind, as well as fossil resources.

3 VALUE OF SOLAR COMPONENTS

The "Value of Solar" (VoS) is a term used to represent the full range of economic value that solar power generation provides to the electricity grid and society as a whole. It is a framework used to determine fair compensation for solar energy exported to the grid by solar power systems. The VoS can take into account various factors, including the environmental benefits, energy generation, and the grid-related services provided by solar power systems. The specific methodology and factors considered in calculating the VoS can vary depending on the region, local regulations, and the utility company involved. The VoS is used as a basis to establish fair compensation mechanisms that allow solar power system owners to receive payments or bill credits for the electricity they generate and export to the grid. These mechanisms aim to ensure that solar power system owners are appropriately compensated for the value they provide to the electricity system and society.

The VoS reflects the full “Value Stack” of economic and environmental benefits made possible by building and operating solar power plants:

1. Direct Benefits
    a. Avoided Generation Energy Costs;
    b. Avoided Generation Capacity Costs;
    c. Avoided Transmission & Distribution Capacity Costs; and
    d. Avoided Reliability-Related Economic Losses.
2. Societal Benefits
    a. Avoided Emissions Damages; and
    b. Local Economic Value Added.

The values are described fully below.

3.1 Avoided Energy Costs

Avoided generation energy costs are the customer bill savings realized by not having to produce or procure energy from traditional generation sources, such as coal or natural gas. When a solar power system is deployed, the cost to generate electricity is primarily based on the initial capital expenditure and minimal fixed operational expenses. After the system is deployed, however, the 'fuel' – sunlight – is free. This is in contrast to conventional power plants, which rely on the cost of purchasing, transporting, storing, and disposing of the waste from fossil fuels. Therefore, solar can “avoid” the need to generate energy from fossil generation resources with higher fuel and operating costs.

3.2 Avoided Capacity Costs

Avoided generation capacity costs are the expenses that a utility avoids by not having to invest in, operate, and maintain additional power generation infrastructure by procuring an equivalent amount of generation capacity from solar projects. The term "capacity" in this context refers to the maximum output that a power plant or a power system can produce. For solar power, this refers to the value that is created by reducing the need for additional or upgraded traditional power plants like coal, gas, or nuclear, which

are often expensive to build, run, and maintain. When net metered solar projects generate electricity, the electricity is consumed on-site, with any excess being fed back onto the grid. This supply of power decreases the overall demand that the utility or grid operator needs to meet. As a result, the utility does not have to rely as much on traditional power plants or invest in building new ones to meet peak demands. When the need for traditional power plants decreases, the associated costs of these plants – capital costs, operation and maintenance costs, and even decommissioning costs at the end of their life – are also avoided. In short, on-site solar projects allow the utility to avoid incurrence of capital cost to construct power generation that would otherwise be needed to meet the demand and energy requirements of the utility.

3.3 Avoided Transmission and Distribution Costs

Avoided transmission and distribution capacity costs reflect the reduced need for investments in constructing and maintaining transmission and distribution infrastructure. With on-site solar, power is generated at the point of use. This reduces the need for investments in transmission lines, substations, transformers, and distribution lines, thereby lowering the associated capacity costs that would otherwise have been incurred. It should be recognized that the intermittent nature of solar generation should be and has been considered in the valuation of this benefit. The cost savings are referred to as "avoided" because they represent costs that utilities would otherwise have to incur in order to expand and maintain the grid infrastructure necessary to accommodate increasing demand or replace aging infrastructure.

3.4 Avoided Reliability-Related Losses

Avoided reliability-related losses refers to the increased economic value communities gain when transitioning from a centralized grid to distributed customer-sited solar energy generation. Improved resiliency and reliability allows for more “up-time” for businesses and individuals, which translates to increased economic activity. Solar projects bolster energy security, reducing the risk of power outages by creating redundancy in power sources and often being paired with energy storage, which provides power during grid blackouts and also enables the possibility of customer participation in utility-administered load-shifting programs. These improvements are crucial as power disruptions can lead to significant economic costs, such as lost business revenue, damaged equipment, and productivity loss. This improved resiliency and reliability also provides on-site solar customers with the potential to avoid the health and safety threats caused by blackouts. It should also be recognized that on-site solar projects coupled with batteries further enhances this benefit. We note, however, that this Report focuses on the benefits provided by on-site solar and does not focus on or quantify the additional benefits provided by standalone or co-located storage resources. On its own,, solar not only reduces energy costs and provides environmental benefits but also increases system reliability, providing an additional layer of benefits.

3.5 Avoided Emissions Costs

Avoided emissions and pollutants costs reflect the economic savings resulting from using clean power from solar resources instead of emitting power from traditional thermal resources. Greenhouse gas emissions, including carbon dioxide (CO2), and methane (CH4) are major contributors to climate change, and opting for solar power reduces our impact on global warming. The EPA’s social cost of carbon assigns

a monetary value to the long-term damage caused by greenhouse gas emissions, considering factors like reduced agricultural productivity, health effects, property damages, and changes in energy system costs.[1] Avoided air pollutants, such as nitrogen oxides (NOx), sulfur oxides (SOx), and particulate matter (PM), emitted by traditional energy generation, also have negative effects on human health and the environment. The savings in health and environmental costs associated with these pollutants are calculated based on factors including medical treatment expenses, lost workdays, and environmental degradation costs. These avoided costs highlight the economic and social advantages of solar, which not only generates electricity but also contributes to mitigating climate change, improving public health, protecting the environment, and promoting environmental justice – especially in communities near traditional power plants.

3.6 Local Economic Value Added

Local economic value added refers to the financial and job growth benefits that communities gain when local resources are utilized to construct solar projects. This process stimulates local economies by creating jobs, often in areas such as construction, electrical work, and project management, and circulating money within the local economy. Additionally, these projects can lead to the development of local skills and capacities, further benefiting the local economy. Therefore, solar projects not only offer energy and environmental advantages but also spur local economic growth, providing a multi-faceted benefit.

[1] National Center for Environmental Economics, Office of Policy, Climate Change Division, Office of Air and Radiation, U.S. Environmental Protection Agency. (2022, September). Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances. Accessed at: https://www.epa.gov/system/files/documents/2022-11/epa_scghg_report_draft_0.pdf

4 VALUE OF SOLAR ESTIMATES

This section summarizes our analysis methodology and results.

4.1 Avoided Energy Costs

We determined the value of avoided energy costs by quantifying the hourly energy charges that would be reduced or eliminated when customer-sited solar power would be available and generating power. To estimate hourly solar availability and generation output in Puerto Rico, we used the National Renewable Energy Laboratory's (NREL) PVWatts tool to simulate the weather-normalized annual hourly solar availability and output for 1-MW of solar capacity located in Puerto Rico. To estimate the coincident electricity prices that could be avoided by solar, we relied on Puerto Rico Electric Power Authority's (PREPA) **fuel and variable operations and maintenance costs**, as reported in its 2020 Integrated Resource Plan (IRP), which provides the most recent publicly forecast of Puerto Rico's fleet of operating generators by installed capacity, fuel type, and operating costs. Using this data, we identified the generation unit that would be most likely to be displaced by a lower cost generator or reduction in load from increased BTM solar generation. To align the annual PREPA variable production costs with the hourly NREL generation forecast, we converted the annual production costs into hourly amounts using proxy hourly load profiles of multiple power markets throughout the U.S. using data obtained from S&P Capital IQ.[2] Reliance on proxy data was necessary due to a lack of publicly information for Puerto Rico's hourly generator operations. After converting the annual totals to hourly totals, we then calculated the coincident sum product of the hourly charges that would be avoided during the period of the year in which the solar resource was online and generating power.

Based on this analysis, we calculated an avoided cost value of **27¢/kWh**. This value comprises 82% of the total direct benefits and 26% of the total overall benefits.

4.2 Avoided Capacity Costs

We determined the value of avoided capacity costs by calculating the value of new fossil fuel capacity that could be displaced (i.e., avoided) by reducing system demand using distributed solar. To calculate the value of new fossil fuel capacity, we relied on proxy data for the Cost of New Entry (CONE) of a new natural gas combined cycle using data obtained from PJM's most recent CONE study. Reliance on proxy data was necessary due to a lack of publicly available cost data for new generators in Puerto Rico. To align the PJM cost assumptions with Puerto Rico's comparatively higher build costs, we escalated the proxy values using Puerto Rico Electric Power Authority's (PREPA) assumed build cost premium of 16% from its most recent Integrated Resource Plan (IRP) filing. We then multiplied the CONE value by 25%, which represents the estimated amount of peak load that can be reliably served by new solar, based on proxy data obtained from data on the current Effective Load Carrying Capability (ELCC) class ratings of solar.[3] ELCC is a

[2] Reliance on proxy data was necessary due to a lack of publicly available data for Puerto Rico.

[3] See https://www.pjm.com/-/media/planning/res-adeq/elcc/preliminary-elcc-class-ratings-for-the-2025-26-bra-ferc-docket-no-er24-99.ashx

relatively new, but increasingly common metric used in power markets throughout the U.S. to assess the ability of resources like solar to consistently meet – or "carry" – system demand over the course of a year.

Based on this analysis, we calculated an avoided cost value of **1¢/kWh**. This value comprises 2% of the total direct benefits and 1% of the total overall benefits.

4.3 Avoided Transmission and Distribution Costs

We determined the value of avoided transmission and distribution costs using a range of proxy data for the VoS in (1) avoiding new construction of transmission and distribution lines; (2) reducing transmission and distribution line losses; and (3) increasing retail electricity rates due to the potential cost shifts resulting from fewer customers paying for the same amount of fixed costs relating to existing transmission and distribution infrastructure. The proxy data includes VoS studies commissioned by utilities and utility commissions in multiple states throughout the U.S. Reliance on proxy data was necessary due to a lack of publicly available data needed to extrapolate the VoS in Puerto Rico for these components.

Based on this analysis, we calculated an avoided cost value of **3¢/kWh**. This value comprises 10% of the total direct benefits and 3% of the total overall benefits.

4.4 Avoided Reliability-Related Losses

We determined the value of avoided reliability-related economic losses by identifying the value to customers and the host utility of keeping power on during an outage and then scaling this combined value down using the estimated share of power outages that can be avoided by solar. For data on historical power outages, we relied on the EIA's Annual Electric Power Industry Report, Form EIA-861 detailed data files, which provides historical annual minutes of power outages in Puerto Rico since 2019. To determine the share of the total outages that solar can avoid, we relied on proxy data for the ELCC of solar resources located in PJM. Multiplying the proxy solar ELCC rating by the ratio of historical annual outage hours to the total hours in a year provides an approximation of solar's ability to avoid outages in Puerto Rico.

To identify the value of avoided power outages to customers, we relied on PREPA's estimate for the Value of Lost Load[4] (VOLL) from its 2020 IRP, escalated to the present using inflation data from the U.S. Bureau of Labor Statistics (BLS). To identify the value of avoided outages to the host utility, we used the historical annual average retail price of electricity, as this reflects the actual value of lost revenues to the utility, on average, during an outage. The sum of these two values represents the hypothetical maximum aggregate value of avoiding outages to customers and the utility.

Based on this analysis, we calculated an avoided cost value of **2¢/kWh**. This value comprises 6% of the total direct benefits and 2% of the total overall benefits.

[4] VOLL represents an estimate of customers' willingness to pay to keep the lights on during an outage.

4.5 Avoided Emissions Costs

We determined the value of avoided emissions costs using estimates developed by the U.S. Environmental Protection Agency (EPA) for emissions rates relating specifically to the fossil fuel generators located in Puerto Rico as well as the social and economic damages resulting from the release of harmful greenhouse gas emissions (GHG) and other air pollutants. We quantified the emission rates (in tons per MWh) for each GHG (CO2, CH4, N2O) and pollutant (NOx, SOx, PM) using data from the EPA's eGRID system. We then estimated the displaced emissions, which reflect the emissions avoided by deploying a hypothetical 1 MW solar array located in Puerto Rico, using the NREL PVWatts simulation discussed in the prior sections of this Report. We then assigned costs to these emissions using data from EPA's "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" and "Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5" reports. We then escalated these costs to the current dollar-year using inflation data from the Bureau of Labor Statistics. Lastly, we multiplied the displaced emissions by the emissions cost rates and divided this product by the simulated solar generation output.

Based on this analysis, we calculated an avoided cost value of **54¢/kWh**. This value comprises 78% of the total societal benefits and 53% of the total overall benefits.

4.6 Local Economic Value Added

We determined the value of local economic value added using proxy data due to a lack of publicly available information and resource-intensive nature of the modeling required to quantify these values. The proxy data we relied on for this component includes the estimated local economic value added, measured on a $/kW basis, from building residential solar, escalated to 2023 dollars using inflation data from the Bureau of Labor Statistics (BLS). Because the value-added metric reflects the upfront (year one) value attributable to building a new power plant, it is necessary to levelize the value over the course of the expected operating life to ensure that the value is not overstated on an annual basis. To do this, we calculated a levelized payment using financing assumptions from the PREPA 2020 IRP and related financial reports. Finally, we divided this levelized amount by the forecasted generation output of a hypothetical 1 MW solar array in Puerto Rico based on data from NREL PVWatts.

Based on this analysis, we calculated an incremental value potential of **16¢/kWh**. This value comprises 22% of the total societal benefits and 15% of the total overall benefits.

4.7 Total Solar Value Stack

Based on this analysis, the total estimated solar value stack equals **103¢/kWh**, including 33¢/kWh of direct benefits and 70¢/kWh of societal benefits. Given that the current Puerto Rico net metering value equates

to just 24¢/kWh,[5] this means the current framework for valuing solar in Puerto Rico fails to capture approximately 77% of the known and measurable benefits solar provides:

Direct Benefits

Benefit Type	Value of Solar (¢/kWh)	Value of Solar (Share of Direct Benefits)	Value of Solar (Share of Total Benefits)	Net Metering Credit (¢/kWh)
Avoided Energy Costs	27.25	82.81%	26.42%	24.12
Avoided Capacity Costs	0.60	1.84%	0.59%	-
Avoided T&D Costs	3.24	9.85%	3.14%	-
Avoided Reliability-Related Economic Losses	1.81	5.50%	1.76%	-
Subtotal	**32.90**	**100.00%**	**31.90%**	**24.12**

Societal Benefits

Benefit Type	Value of Solar (¢/kWh)	Value of Solar (Share of Societal Benefits)	Value of Solar (Share of Total Benefits)	Net Metering Credit (¢/kWh)
Avoided Emissions Costs (CO2, CH4, N2O, NOx, SO2, PM2.5)	54.46	77.55%	52.81%	-
Local Economic Value Added	15.76	22.45%	15.29%	-
Subtotal	**70.23**	**100.00%**	**68.10%**	**-**

Total Benefits

Benefit Type	Value of Solar (¢/kWh)	Value of Solar (Share of Total Benefits)	Value of Solar (Share of Total Benefits)	Net Metering Credit (¢/kWh)
Direct Benefits	32.90	31.90%	31.90%	24.12
Societal Benefits	70.23	68.10%	68.10%	-
Overall Total	**103.13**	**100.00%**	**100.00%**	**24.12**

[5] See https://lumapr.com/wp-content/uploads/2023/02/Tariff-Book-Electric-Service-Rates-and-Riders-Revised-by-Order-05172019-Approved-by-Order-05282019.pdf

5 CONCLUSION

Based on the above analysis, this Report finds that:

- The **direct benefit to the grid and all other ratepayers is 33 cents per kWh**, which is 36% greater than the retail rate of 24 cents per kWh. Accordingly, there is no subsidy flowing from other ratepayers to on-site solar customers and, in fact, there are benefits flowing to all other customers from this solar production.

- In addition to these direct benefits to ratepayers, significant social benefits flow to residents of Puerto Rico. These benefits include reductions in air pollution as non-emitting solar energy offsets emissions from fossil fuel power generation. This reduced pollution yields significant health benefits to residents. Reduced pollution can be converted to a dollar value using metrics developed by the US EPA. Additional social benefits are realized because investments in solar projects induce greater economic activity and jobs in the Commonwealth. Together these **social benefits result in an additional 70 cents per kWh** on top of the direct ratepayer benefits.

- Continuation of Puerto Rico's net metering policy will not cause customers to subsidize on-site solar customers. Quite the reverse, this policy realizes benefits to all customers by providing lower cost of energy supply, grid resilience, and other benefits as detailed in this Report.

- Another benefit of continuing this policy is that it permits the continued expansion of solar development in accord with the Commonwealth's broader energy, economic development and sustainability goals. It simplifies the "messaging" to customers who are considering installing solar projects on their sites, as the net metering approach ("letting the meter spin backwards") is highly understandable to customers. This approach has been highly successful through the United States in supporting expansion of solar energy, furthering clean energy development, improving reliability, reducing air pollution, and promoting economic growth.

Looking forward, these on-site solar resources can be effectively integrated, working with the other positive changes being made which will add flexibility to Puerto Rico's energy system, including new, cleaner generation with greater ramping capability, utility scale and customer-sited battery storage, grid supply renewable energy resources, and other improvements. Taken together, these resources will make electricity service more reliable, cleaner, efficient, and more flexible to meet the needs of Puerto Rico.

It is critical for regulators and policymakers to recognize that the value of solar extends far beyond mere avoided energy costs. Its impact on environmental health, system reliability, local economic growth, and sustainability should all be taken into account when shaping policies and setting incentives.

Liability

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